

Expanding Partnerships for Improved Data Quality

Addresses, Features, and Boundaries

Michigan GIS Users Group
June 5, 2014

Gail A. Krmeneč
U.S. Census Bureau
Geography Division

Today's Discussion Topics

Geographic Support System Initiative
(GSS-I)

Boundary and Annexation Survey
(BAS)

Census Geographic Support Major Initiatives

1990 Census – TIGER Introduced

2000 Census – Master Address File Introduced

2010 Census – MAF/TIGER Enhancement Program
including MAF/TIGER Realignment (7.6 meter min. accuracy)

2020 Census – GSS Initiative

What is the GSS-I?

Improved address coverage

Annual, transaction-based address and spatial feature updates

Enhanced quality assessment and measurement

Improved Partnerships

Address Updates



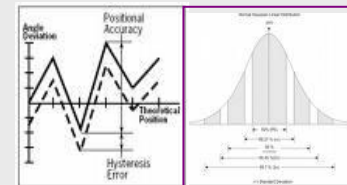
123 Testdata Road
Anytown, CA 94939

Lat 37 degrees, 9.6 minutes N
Lon 119 degrees, 45.1 minutes W

Street/Feature Updates



Quality Measurement



Why the GSS-I?

Recommendations of our stakeholder and oversight communities (GAO, OIG, NAS):

Lack of a comprehensive geographic update program between censuses

Associated negative impact on ongoing programs such as the American Community Survey, other current surveys, and small areas estimates programs

Supports a *targeted* Address Canvassing for 2020 Census





Full Address Canvassing is **VERY** expensive:

- Addresses to be verified: **145 million**
- Census workers hired: **140,000**
- Hand-held computers: **151,000**
- Local Census Offices managing operations: **151**
- Operational Dates: **March 30 - July 2009**

Why “Targeted” Address Canvassing?

Target only areas with uncertainty

- Quality of Addresses

- Currency of Addresses

Hinges on establishing an acceptable address list for each level of government

GSS-I Partnership Program

- Launched October 2012
- Opportunity for tribal, state, county, and local governments to continually exchange address & spatial data with the Census Bureau
- Recognizes local governments as a definitive authority for quality address and street data within their communities
- Leverages the Census Bureau's broad partner network to encourage participation

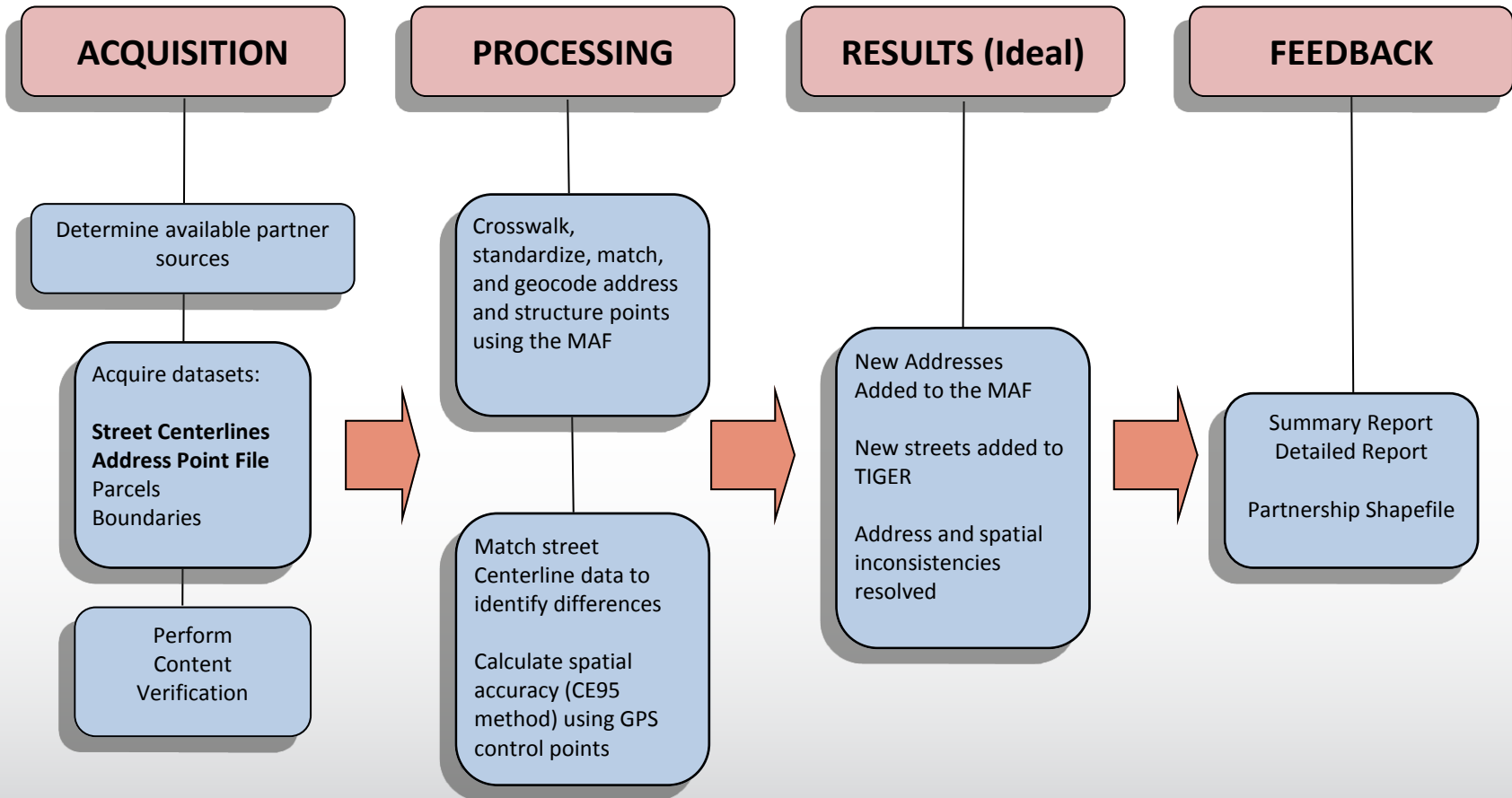
Benefits of Participation

- Expanded ROI – encourages re-use of local government geospatial data investment
- Reduces redundant federal data collection efforts
- Increases usage of high-quality local government data for multiple federal programs, including the 2020 Census and the USGS National Map
- Supports the American Community Survey
- Closes the gap between partner addresses and Census addresses for 2020 Local Update of Census Addresses (LUCA) program

What's in it for you?

- **Improved** address and feature coverage
(local govts are authoritative source)
support current survey samples, including the American Community Survey
- More **current** data and **improved** process flows
should minimize the impact of programs like LUCA
- **Accurate** 2020 Census
- Our evaluations & feedback may help you improve **your** data

High Level GSS-I Process

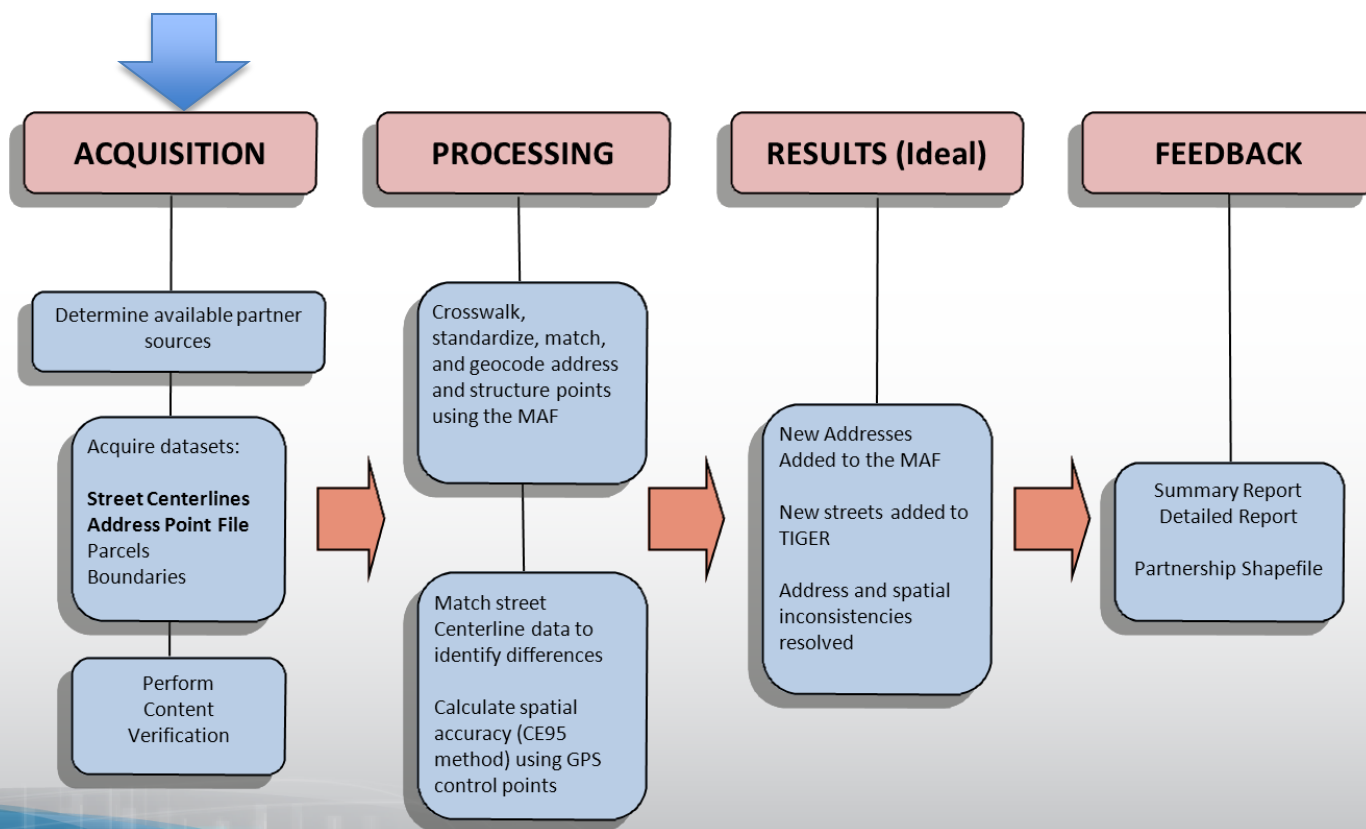


Data Content Guidelines

The Census Bureau has released Data Content Guidelines to describe the minimal and optimal information required for Addresses (including structure points), Street Centerlines, and Metadata provided by partners for the GSS-I

<http://www.census.gov/geo/www/gss/gdlns/addgdln.html>

Partner Data Acquisition and Content Verification

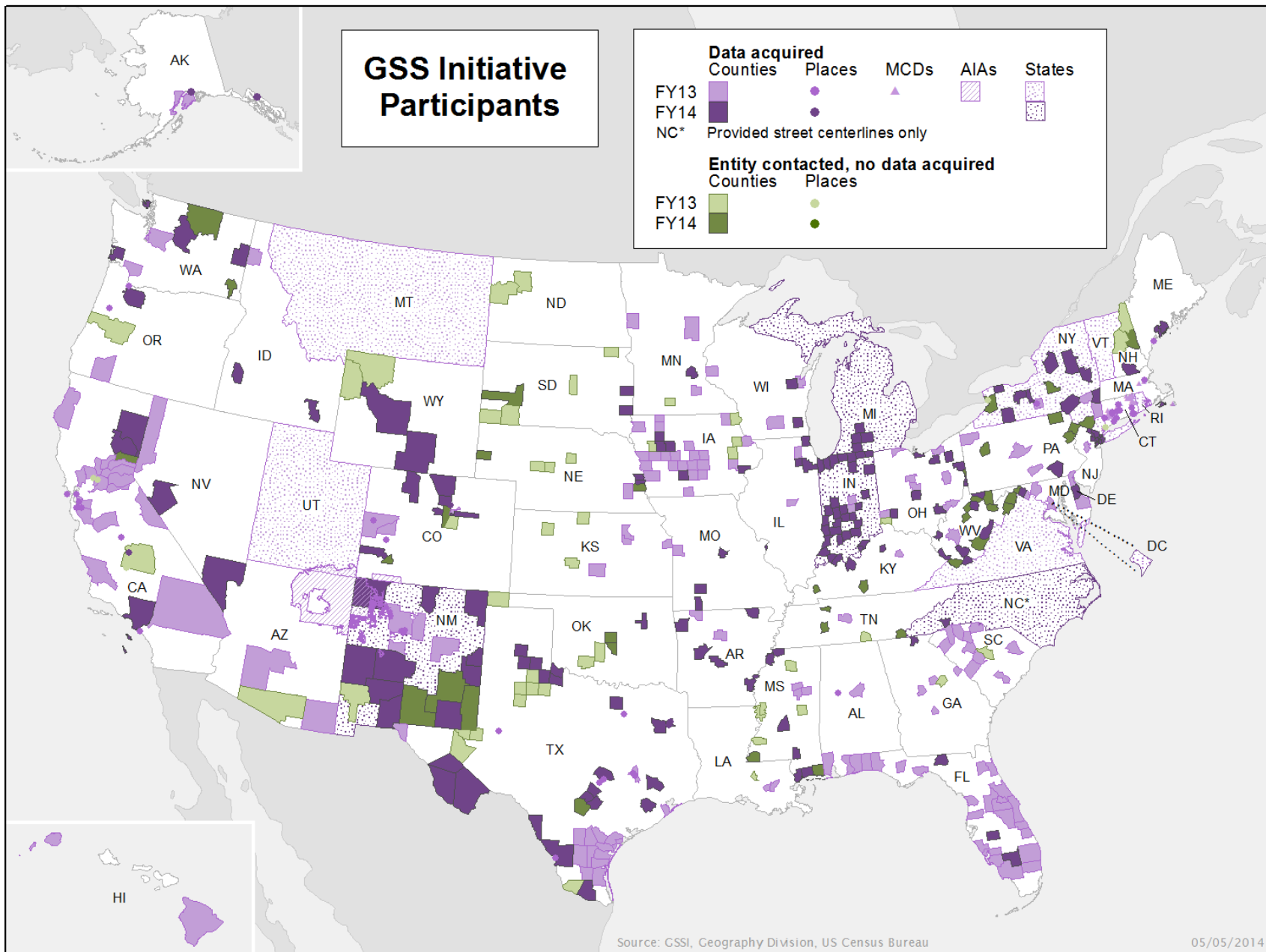


Partner Data Acquisition Status

<i>Data as of May 5, 2014</i>	Partners Contacted	Partners Providing Files	Address List Acquired	Structure Coordinates Acquired	Street Centerlines Acquired	Partner Files Processed
TOTAL	482	313	177	622	691*	859**

* Some counties provided multiple partial-coverage street centerline datasets (i.e., cities vs. balance of county)

** Includes feature and address files processed through the MAF/TIGER system update process



File Content Verification Observations

Incomplete metadata

Projection, datum, data dictionaries, etc.

Coverage gaps

Some counties excluded data for incorporated cities within their legal jurisdiction

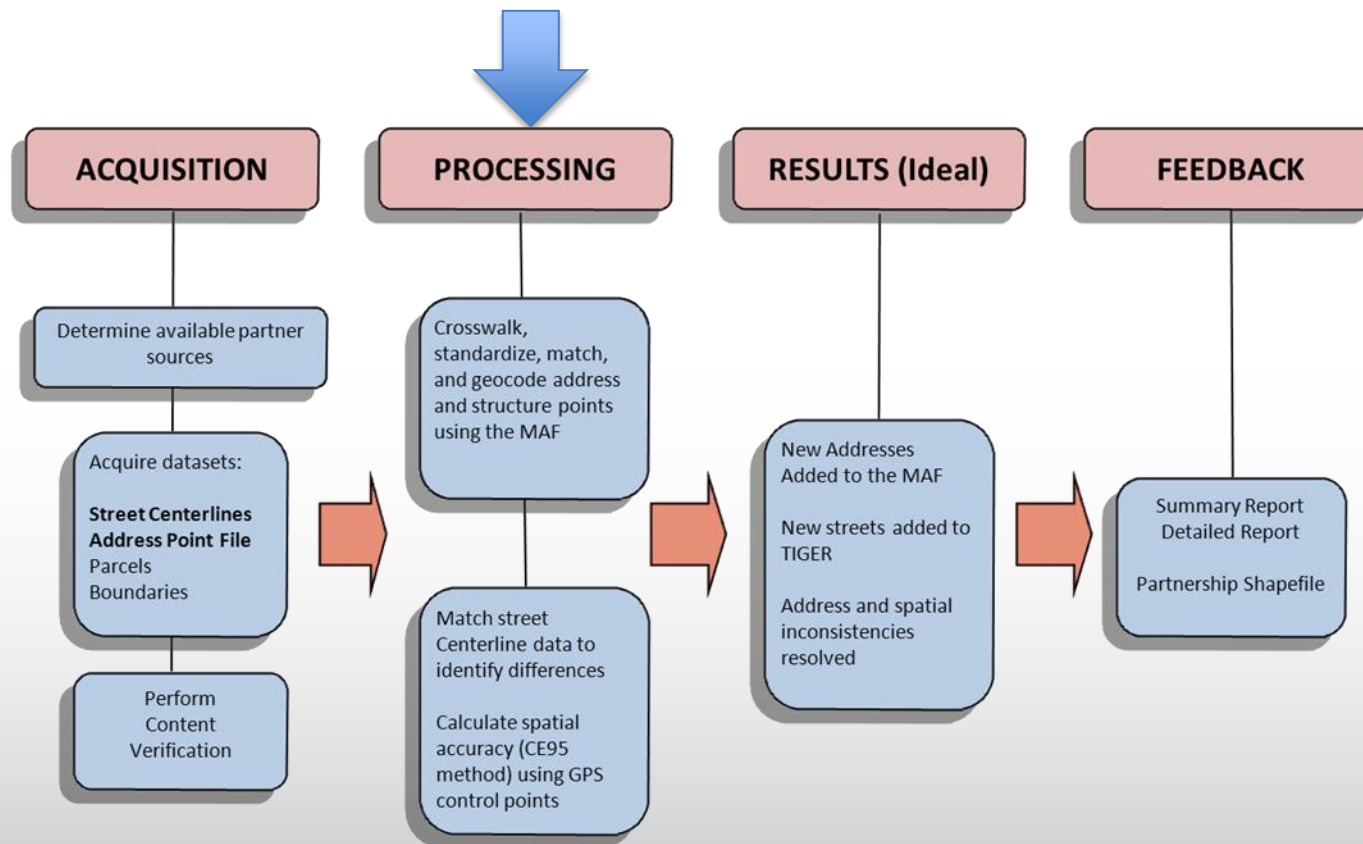
Call-backs for explanations and missing data

Missing Interstate Highway layer, cryptic building use codes, etc.

Failure to meet minimum Street Feature Guidelines

Limits the uses for partner-provided data (i.e., street matching, attribute harvesting, coordinate enhancement)

Partner Address: Matching, Geocoding, MAF Update



Minimum Address Guidelines - MATCHING

To successfully match to the MAF, a partner address must include:

- **Complete Address Number**
- **Complete Street Name**

and AT LEAST ONE OF THE FOLLOWING:

- **Address Coordinate (latitude, longitude)**
- **ZIP Code**
- **Postal City and State**
- **Census 2010 Tabulation State, County, Tract and Block Code**

This minimum information allows the Census Bureau to update the source data for an existing MAF address record, adding to our confidence that the address is valid.

Minimum Address Guidelines - GEOCODING

To **GEOCODE** an existing MAF address, the partner address must meet the **MATCHING** requirements above, and provide one of the following:

Address Coordinate (latitude/longitude)

OR

Census 2010 Tabulation State, County, Tract and Block Code

Minimum Address Guidelines – ADDS

To **ADD** a new partner address to the MAF, the partner address must:

- meet the MATCH requirements above, *and*
- include an **address type indicator** identifying the address as residential, commercial, utility, etc., *and*
- not already exist in the MAF

Minimum Address Guidelines – WITHIN UNIT IDENTIFIERS

For residential addresses with multiple units (i.e., apartments, condos, etc.), the partner address data should provide:

- a unique Within Structure Identifier (apartment #, unit #, etc.) to distinguish each unit from other units at the same Basic Street Address (BSA).
or, if a Within Unit Identifier is not available or does not exist:
- The number of units at the BSA (i.e. “123 Main Street - 25 Units”)
and
- A flag indicating which addresses are multi-unit structures

Minimum Address Guidelines – GROUP QUARTERS

For Group Quarters addresses (i.e., dormitories, prisons, residential medical facilities, etc.), the Census Bureau requests the following information in addition to the address information required for MATCHING and GEOCODING:

- NAME (i.e. Shady Acres Retirement Home) of the Group Quarters, *and*
- TYPE (i.e., Hospital, Prison, College Dormitory) of Group Quarters

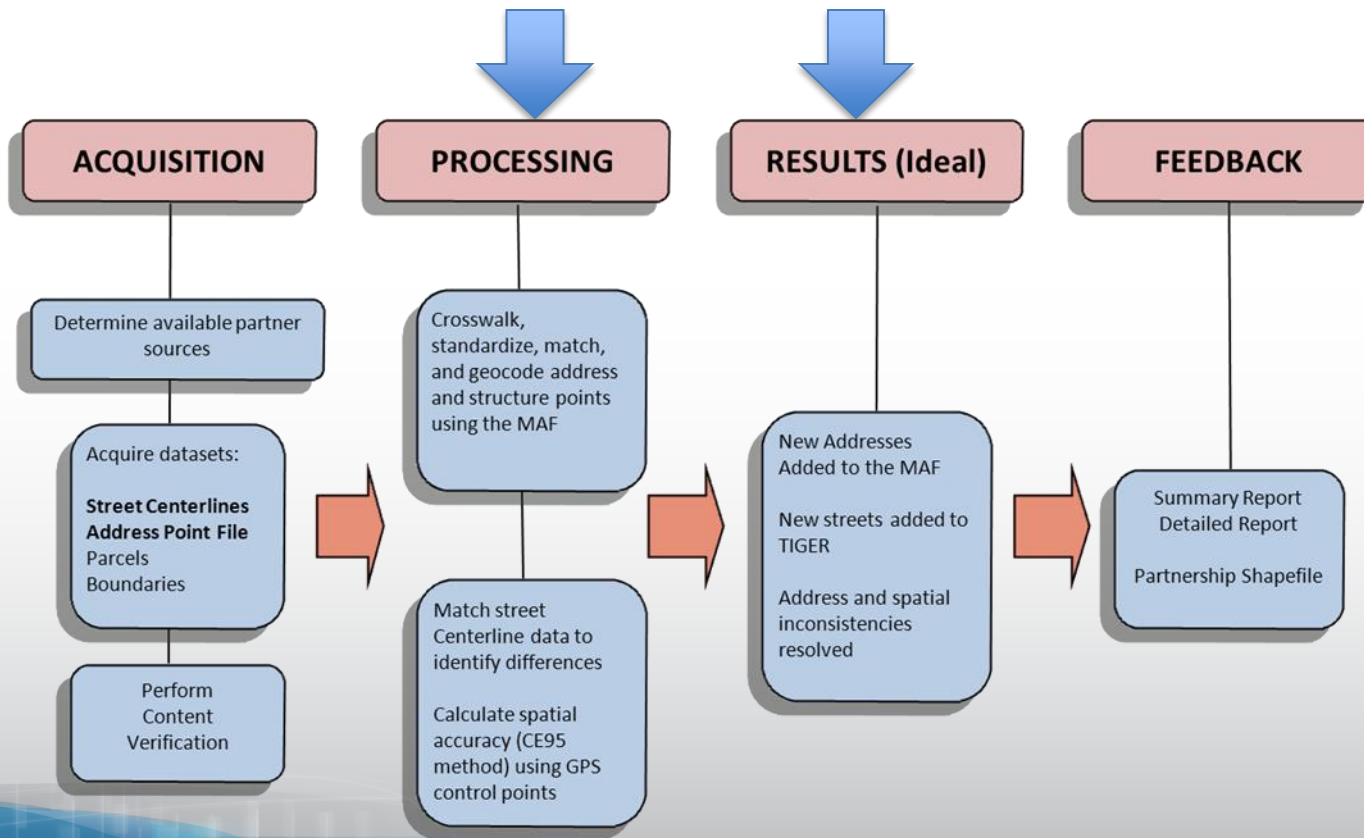
Minimum Address Guidelines – NON CITY-STYLE ADDRESSES

Census Bureau currently does not attempt to match or add any address records that contain only **Non-City-Style Addresses**, such as:

- Rural Route Addresses (i.e. RR 3 Box 725 Anytown, ST 12345)
- Post Office Box Addresses (i.e. P.O. Box 12374 Anytown, ST 12345)
- Highway Contract Addresses (i.e. HC 3 Box 330 Anytown, ST 12345)
- General Delivery (i.e. General Delivery Anytown, ST 12345)
- Location Descriptions (i.e. Brick House at intersection of 1st and Main Streets)
- Address Coordinates ONLY

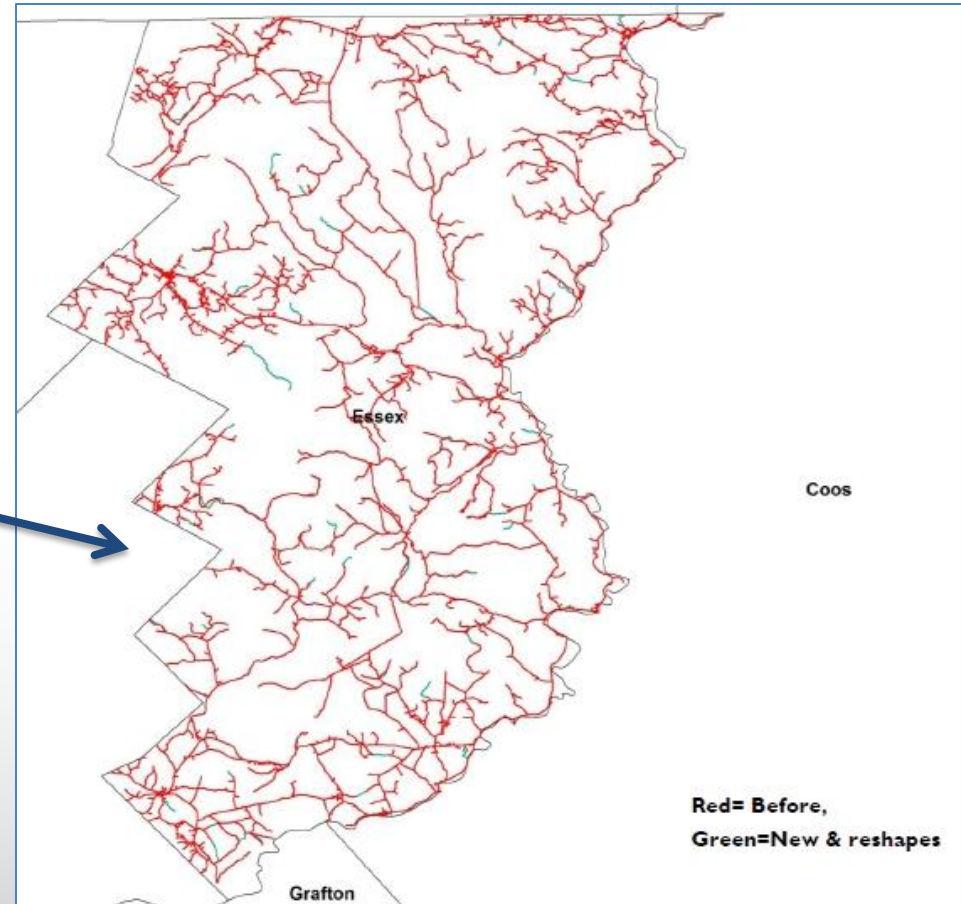
Total Partner Addresses Received (2/20/14)	28,673,572		
Duplicates Addresses Identified within Partner Datasets (multi-unit addresses missing unit identifiers)		1,148,866	4%
Total Unduplicated Partner Addresses		27,526,810	96 %
Total Partner Addresses <u>Matched</u> to Master Address File (MAF)	24,336,743		88% of Total
Addresses in Same Block as MAF		22,526,027	93% of Matched
Addresses in Different Block than MAF		1,410,562	6% of Matched
New Geocode Attained		140,427	1% of Matched
Addresses w/ Same Address Class as MAF (residential, etc.)		12,397,201	51% of Matched
Addresses w/ Different Address Class than MAF		494,185	2% of Matched
Addresses w/ No Address Class Identified		11,445,357	47% of Matched
Total Partner Addresses <u>Unmatched</u> to MAF	3,190,067		12% of Total
Unmatched Class Residential		952,003	30% of Unmatched
Unmatched Commercial/Other/Unspecified		2,238,064	70% of Unmatched

Street Centerline Evaluation and Update



Interactive Review and Update

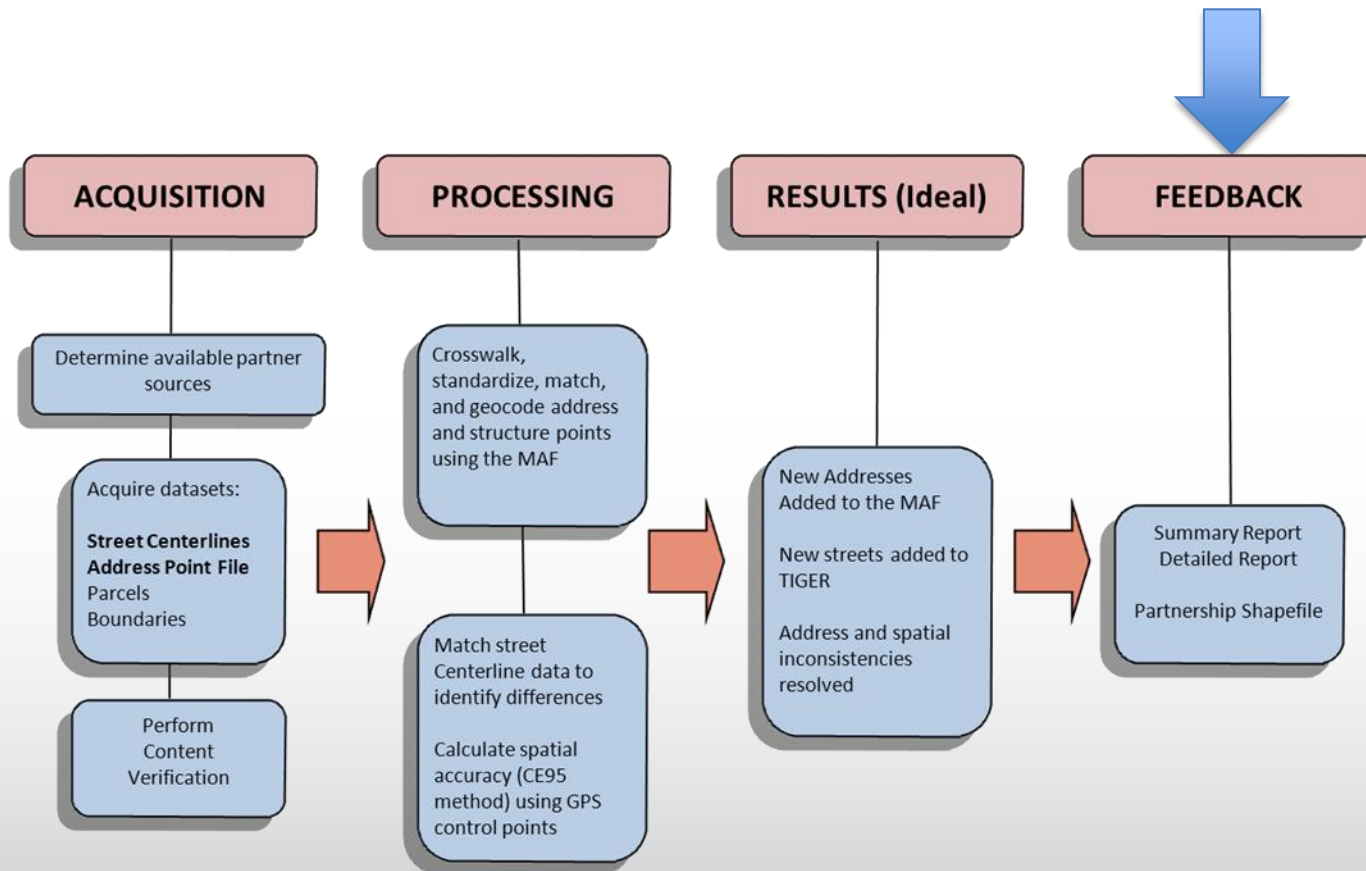
- Digitizers interactively review the potential new and misaligned streets using the partner data and current imagery
- **GREEN** lines indicate street updates made by the Census Bureau based on the partner data
- The Census Bureau added 39 miles of new streets and modified 115 miles of misaligned streets based on this partner's street centerline data



Street Centerline Updates

- 3,105 Miles of new roads added
- 8,887 Miles of updated roads
- 11,992 total miles of feature updates

Partner Feedback



SUMMARY

ADDRESS FEEDBACK REPORT

Column	1. Address Data Submitted to the Census Bureau	Total
F	Total Addresses	34,695
G	Total Residential Addresses	0
H	Total Nonresidential Addresses	0
I	Total Other	34,695
	2. Address Actions taken by the Census Bureau	
J	Total Matched	32,035
K	Total Added	0
L	Total Coordinates Used	30,156
M	Total Not Accepted	2,638
N	Total Not Accepted Duplicate	323
O	Total Not Accepted Incomplete	41
P	Total Not Accepted Other	2,274
Q	Residential Currently in MAF	40,612



DETAILED ADDRESS FEEDBACK REPORT

Partner Addresses
Provided

Partner
Addresses
Matched OR
Added to MAF

Records
Not
Accepted

Number Records
Currently in MAF

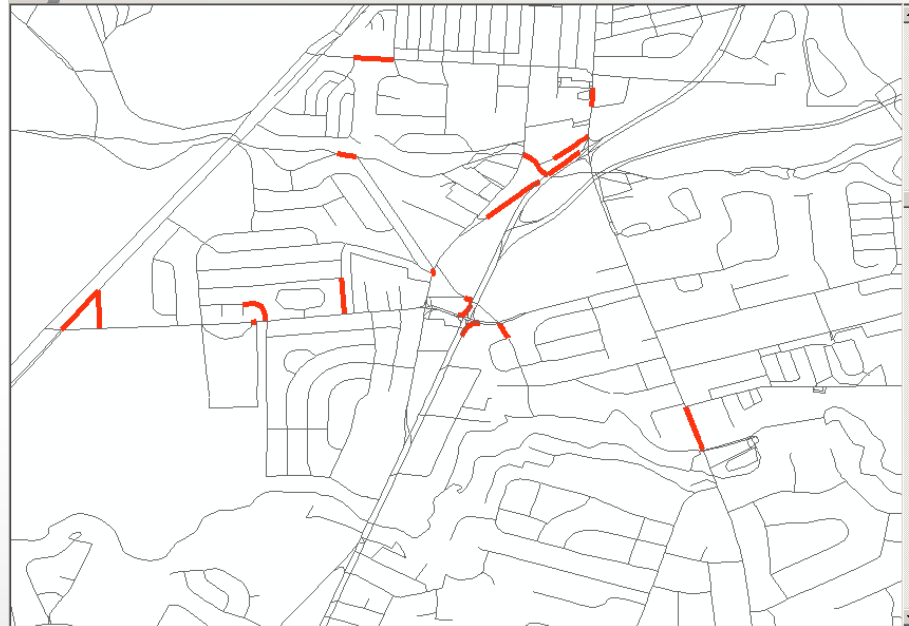
State	County	Tract	Block	GEOID	Total Addressess	Total Residential	Total Non- residential	Total Other	Total Matched	Total Added	Total Coordinates Used	Total Not Accepted	Total Not Accepted Duplicate	Total Not Accepted Incomplete	Total Not Accepted Other	Residential Currently in MAF
					10	0	0	10	10	0	9	0	0	0	0	10
					13	0	0	13	13	0	13	0	0	0	0	16
					12	0	0	12	12	0	12	0	0	0	0	14
					15	0	0	15	13	0	13	2	0	0	2	14
					16	0	0	16	16	0	16	0	0	0	0	22
					13	0	0	13	13	0	13	0	0	0	0	15
					6	0	0	6	6	0	6	0	0	0	0	6
					2	0	0	2	2	0	2	0	0	0	0	2
					9	0	0	9	9	0	8	0	0	0	0	10
					10	0	0	10	10	0	10	0	0	0	0	10
					12	0	0	12	12	0	12	0	0	0	0	12
					22	0	0	22	22	0	22	0	0	0	0	22
					22	0	0	22	22	0	22	0	0	0	0	22
					8	0	0	8	8	0	8	0	0	0	0	8

Feature Feedback

Adding a date of last update field to the **partnership shapefiles**:

live_2014_edges_10001

	MTFCC	FIDELITY	FULLNAME	SMID	MTUPDATE
	S1200	Y	Rd 4	4379	1/2/2013
	H3010	Y	Hudson Br	5364	1/2/2013
	H3010	Y	Meredith Br	5364	1/2/2013
	S1400	Y	Dupont Hwy	4379	1/2/2013
	H3010	Y	St Jones Riv	5364	1/2/2013
	S1200	Y	E Lebanon Rd	0	1/2/2013
	S1400	Y	Green Acres Dr	4379	1/2/2013
	S1200	Y	E Lebanon Rd	4379	1/2/2013
	S1400	Y	Court St	4379	1/2/2013
	S1630	Y		0	1/2/2013
	S1630	Y		0	1/2/2013
	S1200	Y	Korean Veterans Memori	4379	1/2/2013
	H3010	Y		5364	1/2/2013
	H3010	Y		5364	1/2/2013
	R1011	Y	Conrail RR	0	1/2/2013
	S1400	Y		0	1/2/2013
	R1011	Y	Conrail RR	0	1/2/2013



What Can You Do?

Use 'Address Type Indicators' (residential, commercial, utility, etc.) Required to add new addresses to the MAF

Establish 'Within Structure Identifiers' for residential addresses with multiple units (apartments, condos, etc.)

Apartment #, unit #, etc. to distinguish each unit from other units at the same Basic Street Address

Provide your data to the State (MI) to provide to the Census Bureau

For more information, visit:

<http://www.census.gov/geo/www/gss/>

Better Boundary Quality:

Consolidating the Boundary & Annexation Survey

The Boundary & Annexation Survey (BAS)

Background
Consolidation
Why Participate?
Consolidation Status
How Do I Participate?

BAS Background

Census collects boundaries as of January 1 each year
annexations, de-annexations, incorporations, mergers

Survey counties, MCDs (townships) & places (cities, towns, villages) and AIAs:

Michigan: 275 Cities
258 Villages
1573 Townships (MCDs)
83 Counties

Nation: 19,519 Incorporated Places
16,360 Townships
3,031 Counties

BAS Background (Con't)

2 “parts” to BAS:

- 1) provide geospatial changes (change polygons in BAS TIGER file, not just submitting your file)
- 2) provide legal documentation for changes

Can also provide boundary corrections, not just the legal changes (more on this shortly)

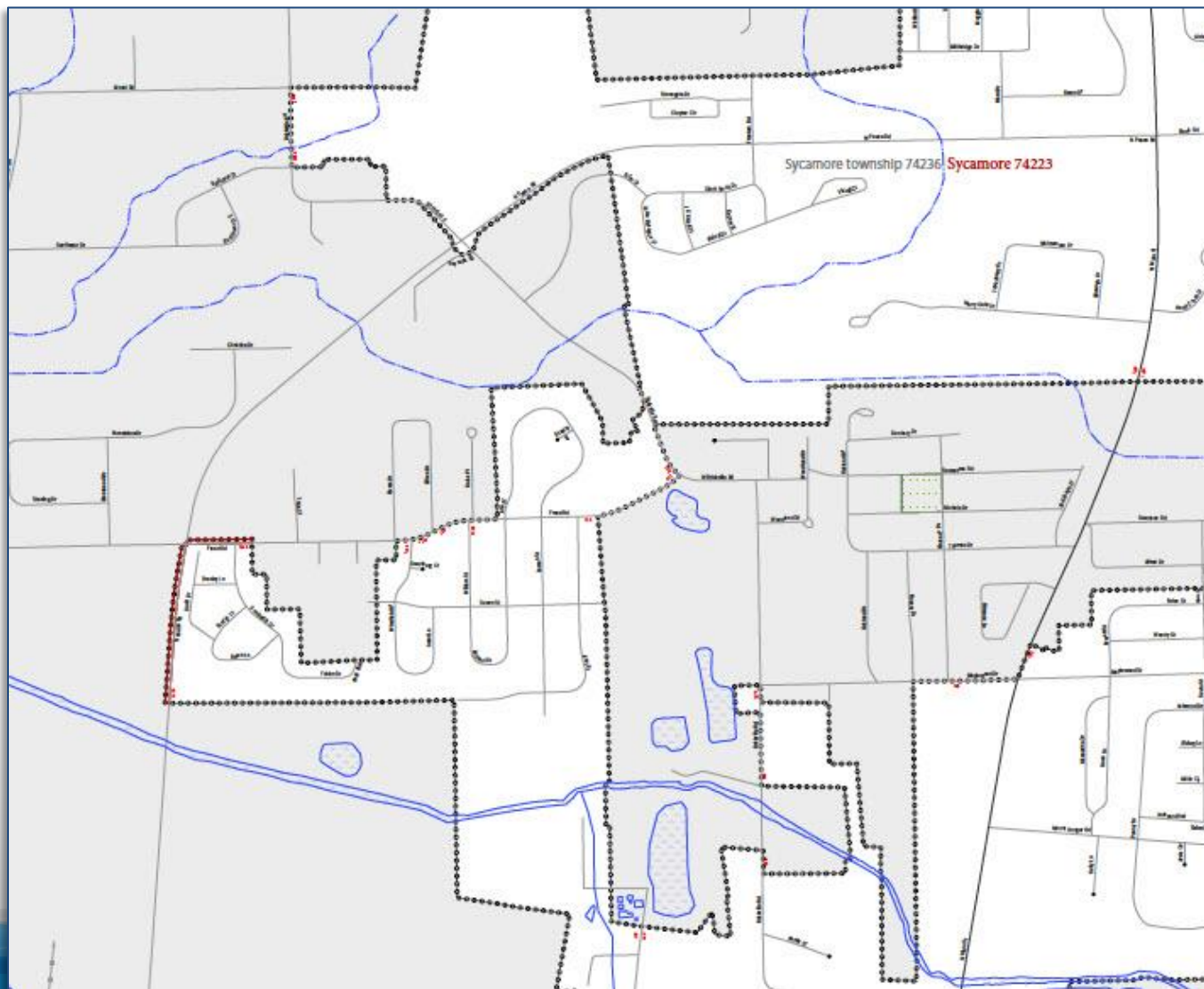
BAS Background (Con't)

May participate digitally, although significant number of governments, especially smaller ones, participate on paper

Paper = *Relative* accuracy?

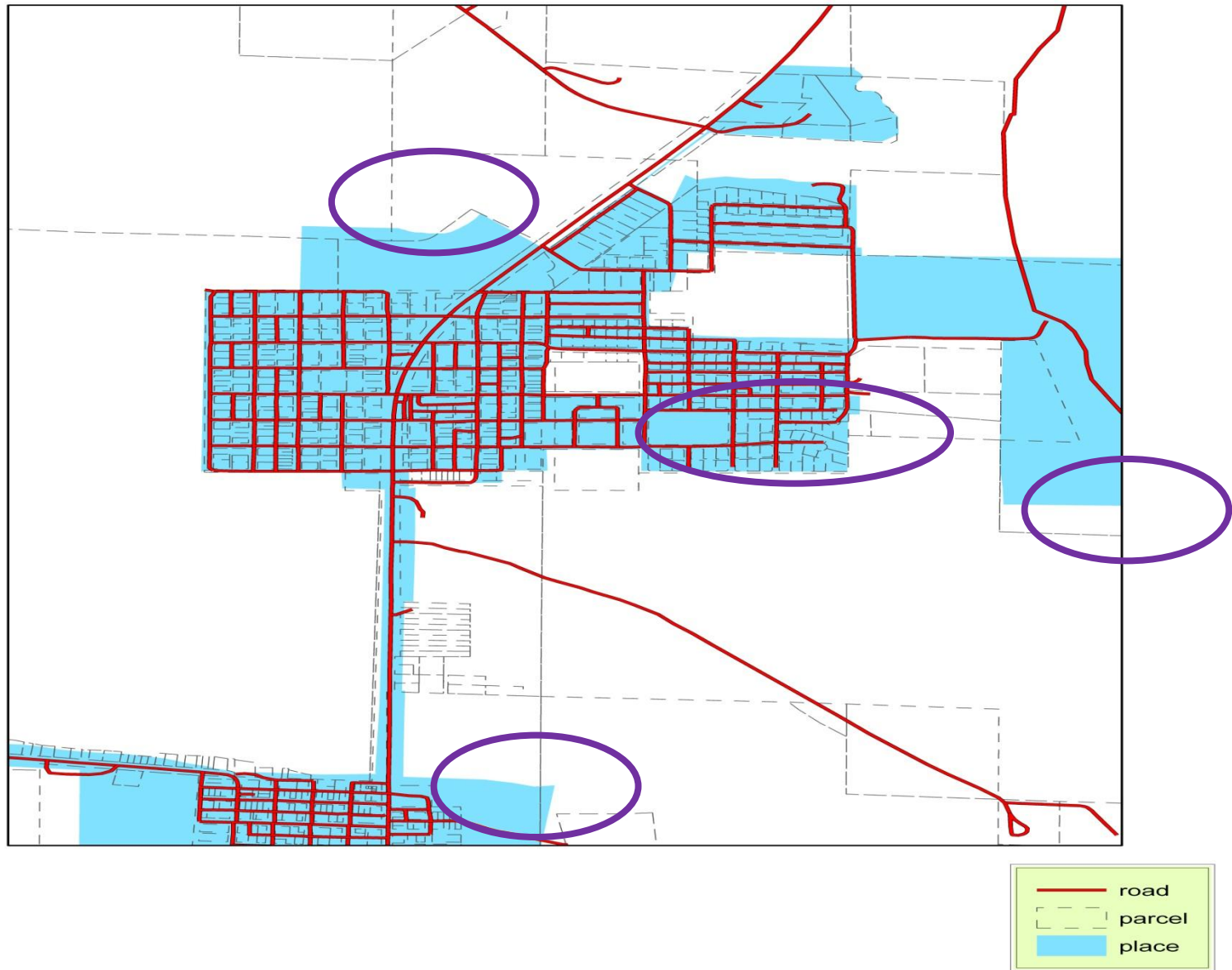
Many do not participate at all (no annexations = no boundary review? Remember MTAIP from the Major Initiatives Slide???)

Paper BAS Map



Inaccuracies:

Visible vs. Non-Visible Boundaries



HOW CAN WE (the Collective “WE”) IMPROVE THE BOUNDARIES IN TIGER?

**State Consolidated BAS
County Consolidated BAS**

What is a State Consolidated Boundary & Annexation Survey?

State responds to BAS for all governments within the state.

- This is appropriate where state law dictates that all governments within the state must provide legal changes to a state office
- Census Bureau and State enter into a Memorandum of Understanding for consolidation

State Boundary and Annexation Survey MOU

The state has options for enacting a State-Level BAS:

- Provide the Census Bureau a list of governments in the State that enacted legal changes in the BAS year;
- Provide the Bureau the geospatial changes for the legal changes (transaction file) and the legal documentation.

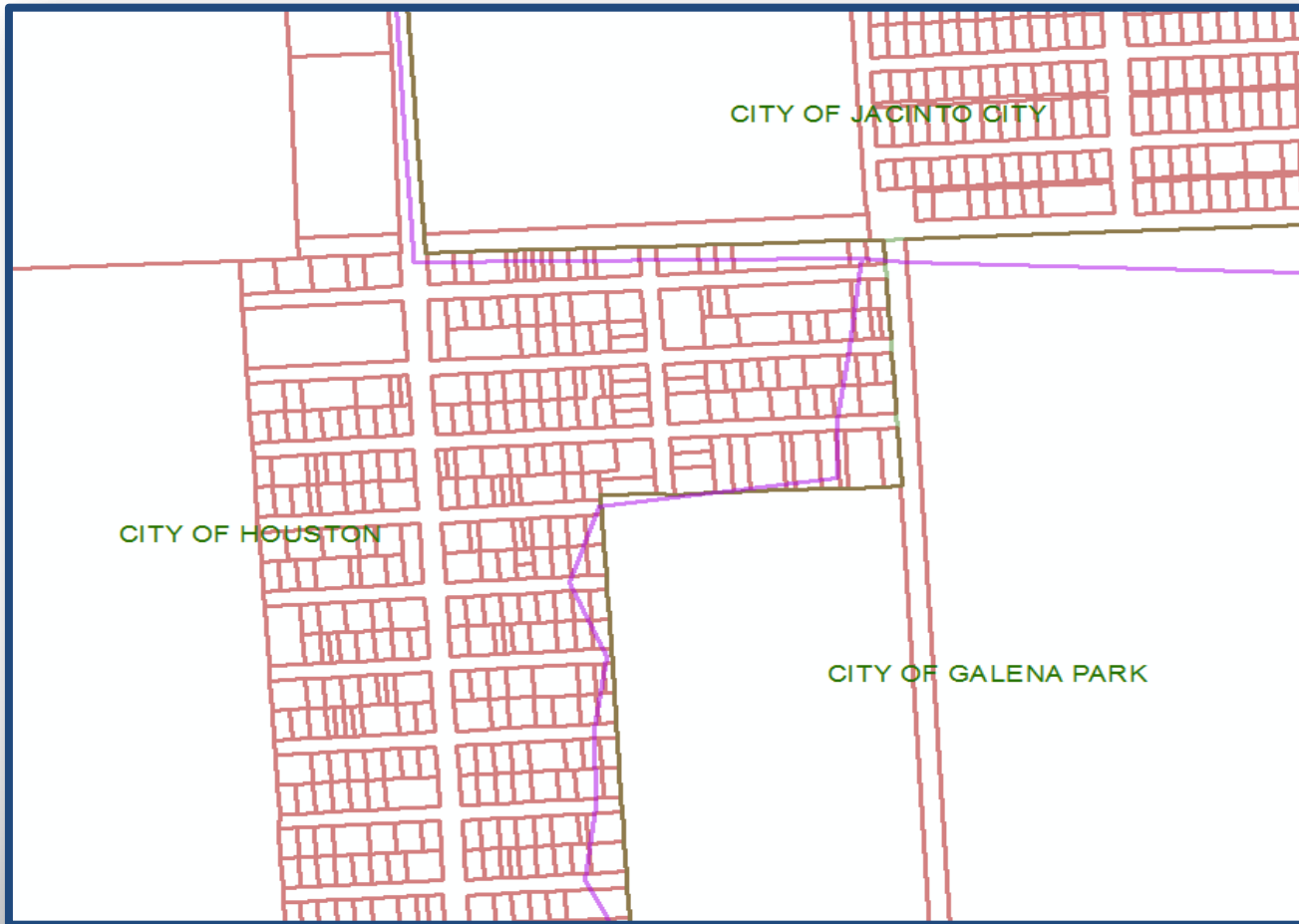
Consolidated BAS Benefits

- State can participate digitally (boundary accuracy!)
- If the state is responding, this provides an incentive to governments to ensure that the state receives their legal changes, on a timely basis
- State is providing a service to the gov'ts in the state
- Provides continuity of BAS contact and response at the state level (as opposed the numerous gov'ts within the state, especially as administrations, staff change in local governments)
- State level BAS contact(s) know BAS program, requirements, what to do and when!

Consolidated BAS Benefits (con't)

- Reduces duplication of effort (with no C-BAS agreement in place, Bureau still surveys all entities, must rectify discrepancies, follow up with non-responders)
- Saves \$\$\$ (i.e., taxpayer \$) because Bureau has to engage fewer entities
- Provides “Roll-Up” of boundaries to State and then to Federal Government
- Contributes to more accurate NSDI (Under OMB Circular A-16, Census Bureau is boundary steward for the Nation)
- Can reduce inaccuracies (you can make boundary corrections), which should impact REDISTRICTING

Inaccuracies: BAS TIGER Place Boundary Compared to Local Parcel Data



Light Purple:
Census Boundary

Green:
City Boundaries

Pink: Parcel

Census clearly leaves
out parcels that include
Housing Units:
Housing Units=pop

Additional Datasets desired with BAS submission (new!)

Parcel Dataset

PLSS Dataset

Both these data sets can help the Bureau improve the overall boundary quality in TIGER

Note: used as reference for boundary alignment; parcel and PLSS data not inserted in TIGER; not released in public Census products

County Consolidated BAS

What if the State can't engage in CBAS?

COUNTY Consolidated BAS

Implementation is different than State Consolidation

(entities in county must agree to consolidation, county solicits their participation)

How Does County Sign up for C-BAS?

Step 1: Complete BAS-6 (C-BAS) Form

[illegible]

County's Information

**Participating
Entities
Info: Census
will pre-
populate for
your county!**

Step 2: Contact entities for participation agreement

[illegible]

County Consolidated BAS

Step 2: Contact entities for participation agreement (con't)

TIPS and TRICKS

- We will provide text county can use in email or letter to solicit participation
- Blast email or .pdf letter sent via email to constituents has been successful in other states
- County BAS “consolidator” has requested presentation time at county-wide municipal clerks’ meeting, made the pitch and signed on entities at the meeting conclusion

County Consolidated BAS

Step 3: Return Agreement to GEO BAS TEAM via email

Once completed, scan form and send as .pdf to
geo.bas@census.gov

Due Date: *August 1, 2014*
(to be in effect for BAS 2015)

County Consolidated BAS

What happens next?

Entities within the county participating in County Consolidated BAS will receive a postcard for the (2015) BAS, indicating that their governmental unit has elected to have the county respond for them
(important because staff/elected officials change)

The counties in C-BAS will receive instructions for completing the BAS

Consolidated BAS More Benefits?

- Redistricting Data Program (State level participation)
Starts FY 2015? with Block Boundary Suggestion Program
- Geographic Support System Initiative (GSS-I)
(collecting address point data, features, and other data layers from locals, ongoing effort)
- LUCA (Local Update of Census Addresses)
- Targeted Address Canvassing? Decision by 2015

State C-BAS (7)

County C-BAS

(Alaska is State Participant, too)

Questions? Ready to Get Started?

Gail A. Krmenec

U.S. Census Bureau

Geography Division

gail.a.krmenec@census.gov

(630) 288-9258

FAQs

What if a place is located in 2 or more counties? Does that place have to get both counties to respond for county C-BAS? Yes and No.

As a COUNTY participating in C-BAS, can we rescind a Consolidated BAS agreement?

Yes. We will then survey all the entities in the county.

As a PLACE participating in County C-BAS, can we drop out of the county agreement?

YES, notify the BAS team (and the participating county).

FAQs

If I provide the parcel dataset to the Census Bureau as part of BAS (or the GSS-I), will these data be released in public TIGER products?

No, the Bureau uses parcels for reference. Parcel data may be used to update the Master Address File, but Title 13 of the U.S. Code restricts the Bureau from sharing individual addresses with the public.

If PLSS data are provided, will these data be included in public TIGER products?

No, PLSS data will be used for reference. But if boundaries follow PLSS lines, edges in TIGER will be flagged & “locked”.